US007844079B2

(12) **United States Patent**
Hassebrook et al.

(10) **Patent No.: US 7,844,079 B2**
(45) **Date of Patent: Nov. 30, 2010**

(54) **SYSTEM AND TECHNIQUE FOR RETRIEVING DEPTH INFORMATION ABOUT A SURFACE BY PROJECTING A COMPOSITE IMAGE OF MODULATED LIGHT PATTERNS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 164 days.

(21) Appl. No.: **12/283,818**

(22) Filed: **Sep. 15, 2008**

(65) **Prior Publication Data**

US 2009/0016572 A1 Jan. 15, 2009

Related U.S. Application Data

(63) Continuation of application No. 10/444,033, filed on May 21, 2003, now Pat. No. 7,440,590.

(60) Provisional application No. 60/382,202, filed on May 21, 2002.

(51) **Int. Cl.**
G06K 9/00 (2006.01)

(52) **U.S. Cl.** **382/108**; 353/34; 352/47; 359/263; 345/582

(58) **Field of Classification Search** 382/100, 382/103, 106, 108, 115, 117, 141, 154, 181, 382/190, 195, 203; 348/61, 77, 135
See application file for complete search history.

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(57) **ABSTRACT**

A technique, associated system and program code, for retrieving depth information about at least one surface of an object, such as an anatomical feature. Core features include: projecting a composite image comprising a plurality of modulated structured light patterns, at the anatomical feature; capturing an image reflected from the surface; and recovering pattern information from the reflected image, for each of the modulated structured light patterns. Pattern information is preferably recovered for each modulated structured light pattern used to create the composite, by performing a demodulation of the reflected image. Reconstruction of the surface can be accomplished by using depth information from the recovered patterns to produce a depth map/mapping thereof. Each signal waveform used for the modulation of a respective structured light pattern, is distinct from each of the other signal waveforms used for the modulation of other structured light patterns of a composite image; these signal waveforms may be selected from suitable types in any combination of distinct signal waveforms, provided the waveforms used are uncorrelated with respect to each other. The depth map/mapping to be utilized in a host of applications, for example: displaying a 3-D view of the object; virtual reality user-interaction interface with a computerized device; face—or other animal feature or inanimate object—recognition and comparison techniques for security or identification purposes; and 3-D video teleconferencing/telecollaboration.

29 Claims, 7 Drawing Sheets